

Outcome evaluation of the Climate, Food and Farming - Global Research Alliance Development Scholarship (CLIFF-GRADS) program

Working Paper No. 276

CGIAR Research Program on Climate Change,
Agriculture and Food Security (CCAFS)

Tonya Schuetz



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



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1. Abstract

This evaluation assessed the outcomes and preliminary impacts of the CLIFF-GRADS program on enhanced capacity for innovation in partner development organizations. CLIFF-GRADS awards grants to Ph.D. students who are studying low emissions development, with a focus on measurement of greenhouse gas (GHG) emissions from agricultural systems. The goals of the program are to build students' research skills in the field of greenhouse gas mitigation in agricultural systems, increase their capacities to understand, investigate, and implement low emissions development, and build students' professional networks in the field of low emissions development. CCAFS invested USD 10,000 per student, 54 students in total over a period of eight years (2011-2018), with 48% women and 52% men participants. The evaluation found that CCAFS support through the CLIFF-GRADS program has been an important capacity development contribution to the graduate students. The CLIFF-GRADS program has had a positive catalytic effect. 31 publications were reported. 80% of respondents applied skills and knowledge from the CLIFF-GRADS program in their work. 71% could initiate new ideas and innovation at their work that made operations more effective. 60% operated new field and laboratory equipment or computer software as a result of the program. 55% built new partnerships. 31% used new or improved research methods. Students indicated that the CGIAR Centers provided strong and skilled support. Some concluding recommendations included, for example, that a clear vision of the results of the CLIFF-GRADS program can strengthen joint efforts by CCAFS and its partners. The role of change agents and champions could be made more explicit during the program.

Keywords

Capacity development; Evaluation

3. **About the authors**

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4. *Acknowledgements*

We want to thank the respondents to the survey and follow-up interviews for their time and contributions to this evaluation. The individual CLIFF-GRADS program participants are listed in an annex of respondents.

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7. CLIFF-GRADS in numbers

2011-2018 – 8 years | 10K USD average per student grant

54 students supported | 48% woman – 52 % man

from 20 countries | 33% Asia – 35% Africa – 24% Latin America – 7% other

Responses from 40 students reported:

96% CLIFF-GRADS students confirmed or confirmed strongly that they deepened their understanding of climate change mitigation in agricultural systems.

94 organizations mentioned that grantees were involved with during or after the CLIFF-GRADS program

93% built new partnerships with colleagues/ partners that they did not collaborate with before ONLY or PARTLY due to the CLIFF-GRADS program.

93% confirmed or confirmed strongly that they learnt new techniques for measurement of agricultural GHGs or carbon sequestration.

93% agreed and agreed strongly that they improved the quality of their thesis due to the CLIFF-GRADS program.

93% used new or improved research methods ONLY or PARTLY due to the CLIFF-GRADS program.

80% applied skills and knowledge from the CLIFF-GRADS program in their work.

85% operated new field and laboratory equipment or computer software that they could not use before ONLY or PARTLY due to the CLIFF-GRADS program.

83% agreed and agreed strongly that they improved their scientific writing and publishing skills due to the CLIFF-GRADS program.

97% could initiate new ideas and innovation at their work that made operations more effective ONLY or PARTLY due to the CLIFF-GRADS program, only 3% said that this did not happen (at all).

50% got a job ONLY or PARTLY due to the CLIFF-GRADS program, for 20% this did not happen at all.

30% mobilized funds for their organization (after program) ONLY or PARTLY due to the CLIFF-GRADS program, while 45% said that this has not happened (yet).

31 publications

8. Introduction

The aim of this evaluation is to assess the degree to which the CLIFF-GRADS program has contributed to enhanced capacity for innovation in partner development organizations. Specifically, the evaluation tests the following hypotheses:

- The CLIFF-GRADS program has increased the capacities of participants to understand, investigate, and implement low emissions development.
- CLIFF-GRADS participants have utilized these increased capacities in their careers in development and research-for-development organizations.
- There is a collection of concrete innovations¹ that CLIFF-GRADS students have brought to partner development organizations that start showing positive outcomes toward mitigation.

The CLIFF-GRADS program

The Climate, Food and Farming - Global Research Alliance Development Scholarships (CLIFF-GRADS) is a collaborative program of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and the Global Research Alliance on Agricultural Greenhouse Gases (GRA). CLIFF-GRADS awards grants to Ph.D. students who are studying low emissions development, with a focus on measurement of GHG emissions from agricultural systems. The program began in 2011 as CLIFF, supported by CCAFS Low Emissions Development (Flagship Program 3 – FP3) and administered in collaboration with the University of Copenhagen and Aarhus University. Beginning in 2018, CLIFF became CLIFF-GRADS, with funding provided by both CCAFS and the GRA with support from the Government of New Zealand. The shorthand “CLIFF-GRADS” is used throughout the report to generally refer to the overall program.

CLIFF-GRADS has awarded grants to seven cohorts of students since 2011. The first two rounds of grants supported students’ own thesis research on climate change mitigation in a developing country. Since 2014, the program has supported students to undertake research and training visits to research centres and universities affiliated with CCAFS or the GRA. Students are matched with a CCAFS or GRA research project at a host institution based on their interests and experience, and they spend 4-6 months at a host institution collaborating with that research project. To provide further opportunities for mutual learning and exchange, CCAFS hosts a scientific workshop for each student cohort, often in conjunction with a scientific conference.

CCAFS invested USD 10,000 per CLIFF-GRADS student, in total 54 students over a period of eight years, between 2011 and 2018, with 48% women and 52% men participants.

The goals of the program are:

¹ *Research and development innovations are new or significantly improved (adaptive) outputs or groups of outputs-including management practices, knowledge or technologies. This could also refer to a significant research finding, method or tool. A significant improvement is one that allows the management practice, knowledge or technology to serve a new purpose or a new class of users to employ it, e.g., a new variety, a blend of fertilizer for a particular soil type, or a tool modified to suit a particular management practice.* (Definition from the CGIAR [guidance sheet on common reporting indicators C1 Innovations](#)). In the case of this evaluation, the expected innovations are more of the kind of management practices, knowledge and acquired skills.

1. Build students' research skills in the field of GHG mitigation in agricultural systems.
2. Increase students' capacities to understand, investigate, and implement low emissions development.
3. Build students' professional networks in the field of low emissions development.

9. *Evaluation method*

The evaluation method draws from an adapted version of the contribution analysis methodology ([Mayne 2008](#) and [Life Changes Trust](#)) as this was thought to be a good fit for the evaluation objectives. It also draws heavily on impact pathways and theories of change thinking, which are both a conceptual and operational core of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

We adapted the six steps of the contribution analysis to better fit the scope and framing of this evaluation, which are explained in more detail below:

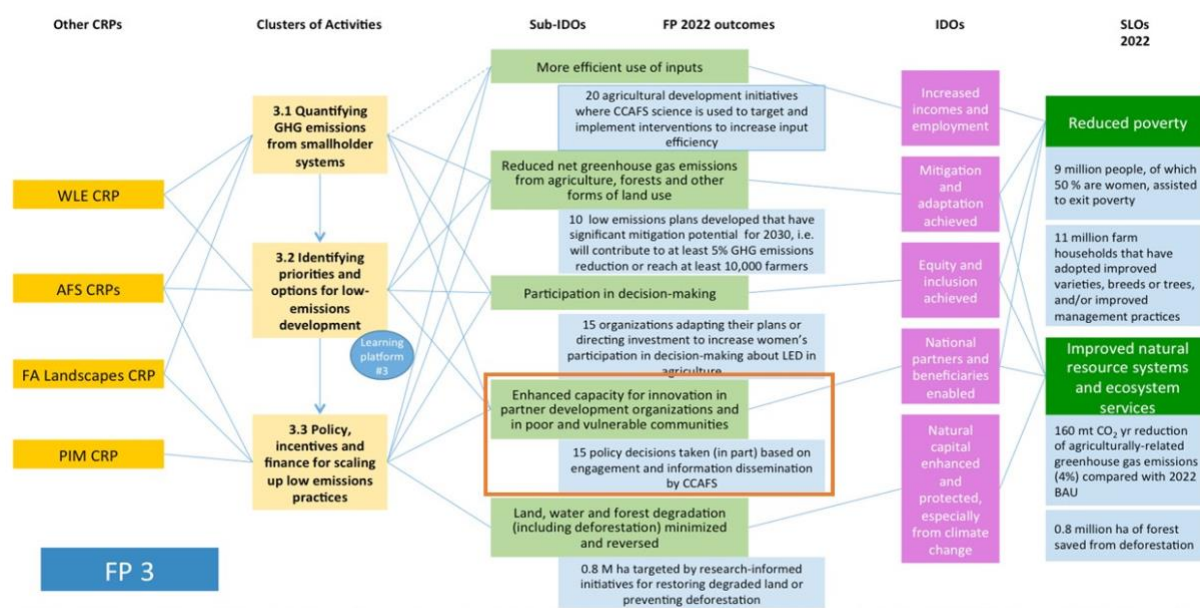
1. Developed an impact pathway and a short theory of change for the CLIFF-GRADS program that is nested with the overarching Flagship 3 impact pathway. It also included the key assumptions.
2. Collected existing data and evidence through existing evidence from the administrative side and an additional survey conducted with the CLIFF-GRADS program participants on results (activities, outputs and outcomes).
3. Sought out additional evidence through follow-up interviews with selected respondents to the survey to complement existing evidence in form of outcome statements/ claims.
4. Synthesis of findings and results towards key conclusions.

Step 1: Impact pathways and theories of change

Each CCAFS Flagship Program (FP) has done at the onset of the program its ex-ante impact assessment with targets in form of nested impact pathways that link research activities and outputs to desired outcomes and impacts on people's wellbeing. One of the desired outcomes for CCAFS FP3 on Low Emissions Development is "enhanced capacity for innovation in partner development organizations and in poor and vulnerable communities," with a target of 15 policy decisions taken (in part) based on engagement and information dissemination by CCAFS by 2022 (see section outlined in red in figure below). The CLIFF-GRADS program is aligned with this outcome within the impact pathway.

The CLIFF-GRADS program set up in 2011 was intended as a delivery mechanism to enhanced capacity for innovation in partner development organizations and in poor and vulnerable communities for FP3. This is indicated in the FP3 impact pathway towards its projected outcome targets defined as 15 policy decisions taken (in part) based on engagement and information dissemination by CCAFS (see Figure 1 red box).

Figure 1. CCAFS Flagship 3 impact pathway

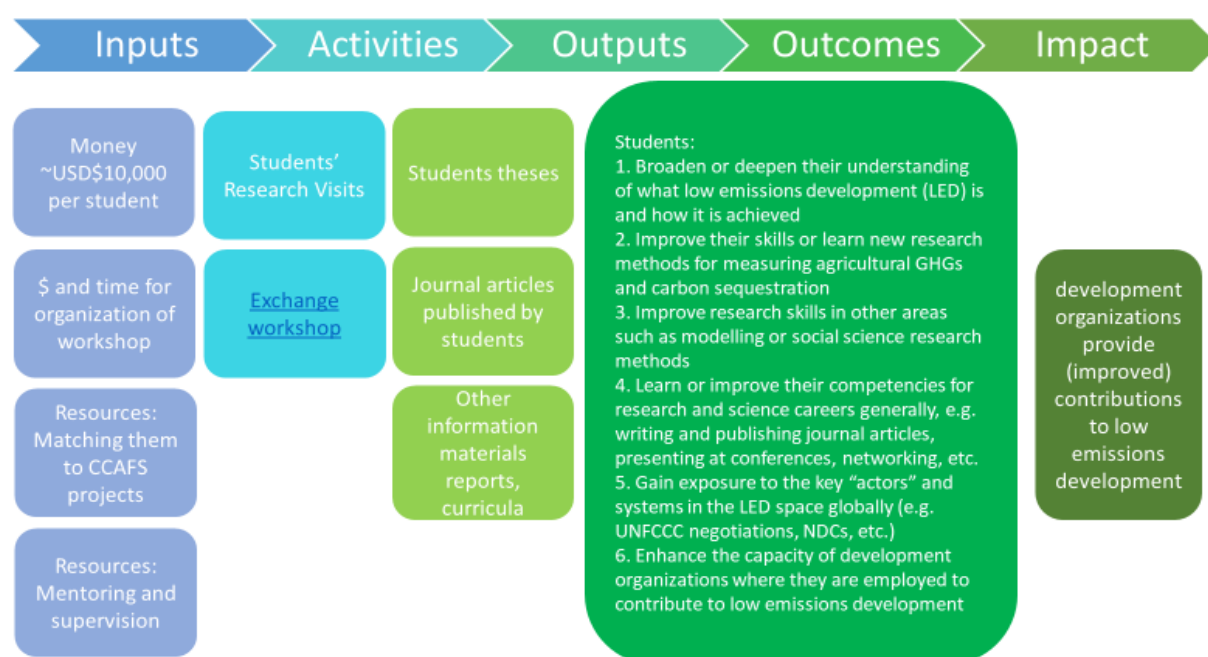


Source: CCAFS Phase II proposal.

CLIFF-GRADS program impact pathway

For the CLIFF-GRADS program itself and for the purpose of this evaluation a further defined impact pathway with key assumptions was developed which shows the direct and indirect costs input side by CCAFS, guided the set-up of the survey questionnaire, the follow-up interviews and allows to explain the findings of this evaluation (see Figure 2).

Figure 2. CLIFF-GRADS program impact pathway



Key assumptions

The impact pathways for the CLIFF-GRADS program as shown in Figure 2 has some key underlying assumptions.

For the delivery of the outputs these are:

1. Students finish their PhDs.
2. Students publish scientific articles from their PhDs or field work.
3. Research hosts contribute to skills and capacities of participants.
4. Exchange workshop contributes to skills and capacities of participants.

For the support of the outputs towards the delivery of the outcomes these are:

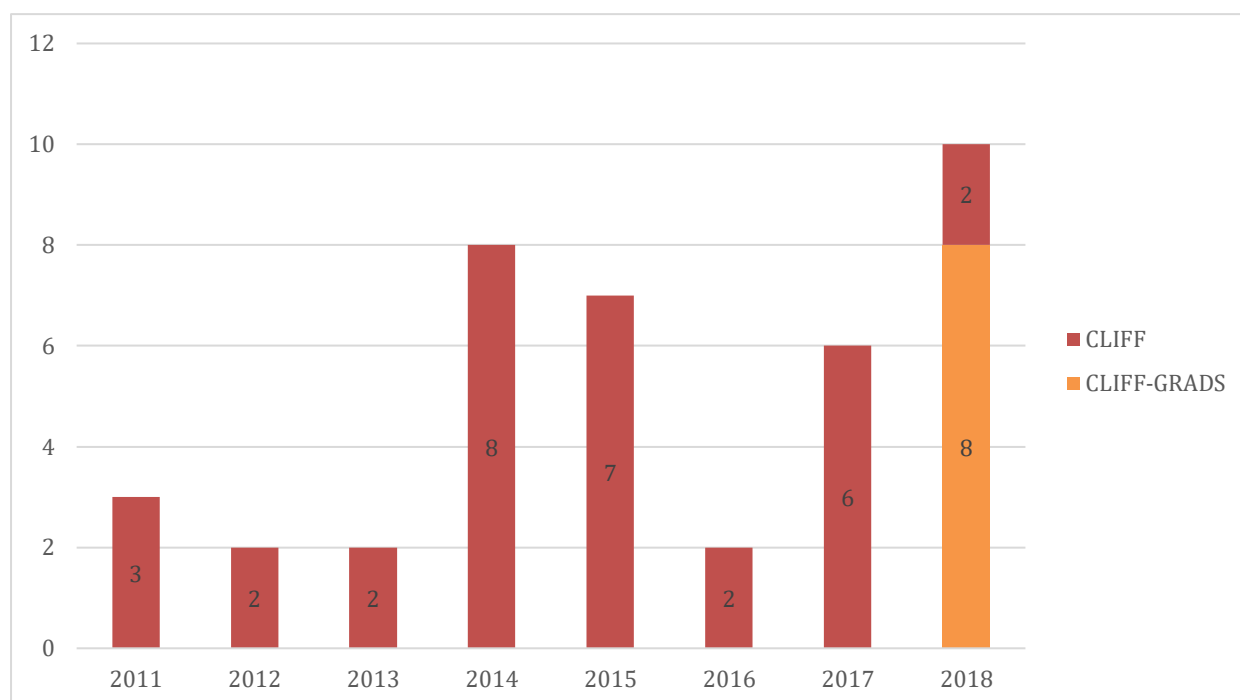
1. Participants go on to work in the field of low emissions development or similar.
2. Participants find jobs with development institutions or similar.
3. Participants are in positions where they are able to influence the work of their organizations.

Step 2: Collecting existing data and evidence

Designed and conducted a **survey of 53 previous CLIFF participants** (2011-2018) to elicit qualitative and to some extent quantitative information about current employment, experience in the CLIFF-GRADS program, and contribution of the program to skills and capacities used in post-PhD work. Participants were given two weeks to respond to the survey. Survey was done web-based through MonkeySurvey (see Annex 1). The contact information for CLIFF-GRADS participants was provided.

The survey was sent to a total of 53 participants (8 CLIFF-GRADS and 45 CLIFF program participants). They were given a period of two weeks to respond. Overall 75% (40/53) participants responded. The distribution between CLIFF-GRADS and CLIFF program was the following: CLIFF-GRADS 100% (8/8) response rate and CLIFF program 71% (32/45).

Figure 3. CLIFF and CLIFF-GRADS program respondents



Step 3: Seeking out additional evidence

To seek out additional evidence we aimed to conduct **follow-up interviews with ~10 survey respondents**, prioritizing those who are likely to have finished their Ph.D. program and have moved on to employment, to provide further insight into the ways in which the activities have contributed to the desired outcome. We aimed to:

- Ensure at least half of interviewees are women, and consider including questions that address gender and social inclusion issues.
- Ask the respondents about innovations that they have made at their organizations that brought about positive changes further down the impact pathway.
- Describe changes in knowledge, attitude, skills and practices of the participants and how these changes have (or have not) impacted their work at development organizations, for example, in form of a short outcome case report².

² Depending on survey results and interviews, how big or small their change stories might be, the outcome reports could be featured in the format of the standardized CGIAR Outcome Impact Case Reports, which would need to be backed up by evidence, one of which would be the evaluation that we are conducting with the interviews, ideally also with people substantiating the claims that were made by the students.

Selection criteria were:

- Who said that they are available for follow-up interview (this is a no-brainer, but some still did give us their contacts therefore thought it is worth to mention).
- High scores in their responses (note: highest scoring respondent was not available for follow-up interview).
- Positions mentioned at organizations, which are influential further down the impact pathway.
- Geographic coverage of the five CCAFS regions.
- Spread over the different years that the program runs.
- CLIFF and CLIFF-GRADS program representation.
- Gender focus that was explicitly mentioned.
- Triangulate respondents' self-assessments with evidence of changes or substantiation through referred third parties, e.g., additional interviews, e-mail correspondence.

A total number of **eight follow-up interviews** of 60-90 minutes in length were conducted, largely based on availability. Respondents were 75% female grantees and 25% male. Geographic and regional distribution was for Latin America: Columbia, Argentina (2x), East Africa: Kenya, West Africa: Nigeria, South East Asia: Nepal and Vietnam, Europe: Spain (see table 1).

Table 1. Overview of conducted interviews

Code*	CLIFF Year	Interviewed time (CEST)	Gender	Nationality	Region**
C08	2015	23.05.2019 - 14.00-15.00	Female	Argentinian	LAC
C16	2016	28.05.2019 - 10.00-11.00	Female	Nepalese	SEA
C17	2014	29.05.2019 - 20.30-21.30	Female	Nigerian	WA
C21	2017	30.05.2019 - 21.30-22.30	Female	Columbian	LAC
C23	2014	29.05.2019 - 15.30-16.30	Male	Vietnamese	SEA
C27	2018	27.05.2019 - 11.00-12.00	Male	Kenyan	EA
C31	2013	07.06.2019 - 14.00-15.00	Female	Spanish	EU
G01	2018	28.05.2019 - 21.30-22.30	Female	Argentinian	LAC

* Survey respondents code: Cs are from the CLIFF program and G indicates CLIFF-GRADS program participants (which started since 2018)

** LAC: Latin America, EA: East Africa, WA: West Africa, EU: Europe, SEA: Southeast Asia

The summary bullet points of the interviews are captured in Table 2 below and the more elaborate outcome statements are in the Annex 3.

10. Key findings

Findings are presented first on reported outputs already published and some forthcoming (especially for the more recent CLIFF-GRADS program participants), followed by an overview of the reported outcomes, which are defined by CCAFS as changes in behavior, which can show in early stages as knowledge, attitude, skills and practice changes, with an indication of the level of maturity of the outcomes. Additionally, there is an evidence section with testimonials.

Reported outputs

31 publications and four further submitted articles/publications/theses and currently under review were reported. In terms of timeframe it shows that it takes a couple of years after submission of their thesis that they produce some articles as the grantees from 2018 mentioned ‘not yet’, ‘coming soon’, ‘working on it’. See for detailed list of mentioned outputs in Annex 2.

Outcomes from the follow-up interviews

From all the interviews, one common significant theme mentioned in all of the follow-up interviews was the extraordinary gratitude and appreciation of the opportunity and individual capacity gained and built through the CLIFF-GRADS program. They mentioned positively the exposure to the colleagues mentoring and providing supporting to the CLIFF-GRADS grantees and the creation of a long-lasting network for future research development of the candidates. Evidence of this is shown and further elaborated in the short outcome statements, quotes and detailed interview notes (internal) by the interviewees in Annex 3.

Table 2. Summary bullet points of reported outcomes

CLIFF-GRADS grantee	Brief outcome description
Cristina Arias-Navarro, CLIFF program 2012-2013	<ul style="list-style-type: none"> High-level policy contributions to the Intergovernmental Panel on Climate Change (IPCC) report and Subsidiary Body for Scientific and Technological Advice (SBSTA) side events Support to fellow researchers and linking them into networks that she built during her CLIFF program participation. Reminding colleagues in Europe of realities in terms of equipment in less developed countries
Taiwo B. Ayinde, CLIFF program 2014	<ul style="list-style-type: none"> Building self-confidence - CGIAR hosting center and expat scientists in that the latter made her believe in herself Multiplier and champion, teaching Farm Management National Diploma 1 and 2 with an average of about 150 students and the Higher National Diploma 1 with max. 33 about optimization.
Vu Duong Quynh, CLIFF program, 2014	<ul style="list-style-type: none"> Publishing and serving as a reviewer agricultural Vietnamese journals; Tailoring expert presentations to different audiences, e.g. at workshops held by different entities: Ministry of Natural Resources and Environment (MONRE) and Ministry of Agriculture and Rural Development (MARD) (2018) to develop National D Contribution (NDC) as committed during COP24 to emission reduction submitted to the IPCC; and Department of Crop Production under Ministry of Agriculture and Rural Development (MARD) (2018) on the Province level; SNV, an NGO, (201?) he presented his research results to their staff and local Quang Binh and Binh Dinh Provinces; (approx. 50 people, agricultural staff, farmers and village leaders)
Geeta Bhatrai Bastakoti, CLIFF program 2016	<ul style="list-style-type: none"> Strengthening gender and social equity in Climate Change projects and agendas - through expert consultancies with a wide range of organizations that she does while finishing her PhD. Presented conference paper in Peru IASC 1-5 July 2019 from her PhD work: Pressing Gender Dynamics and Challenges to adaptation - Evidences from Tarai Nepal. Provision of project recommendations with WWF-FRIPAD (2016) - Hariyo Ban Program, e.g. men should be more engaged for the gender equality component, and they accepted the recommendation and included subsequently more men into project.

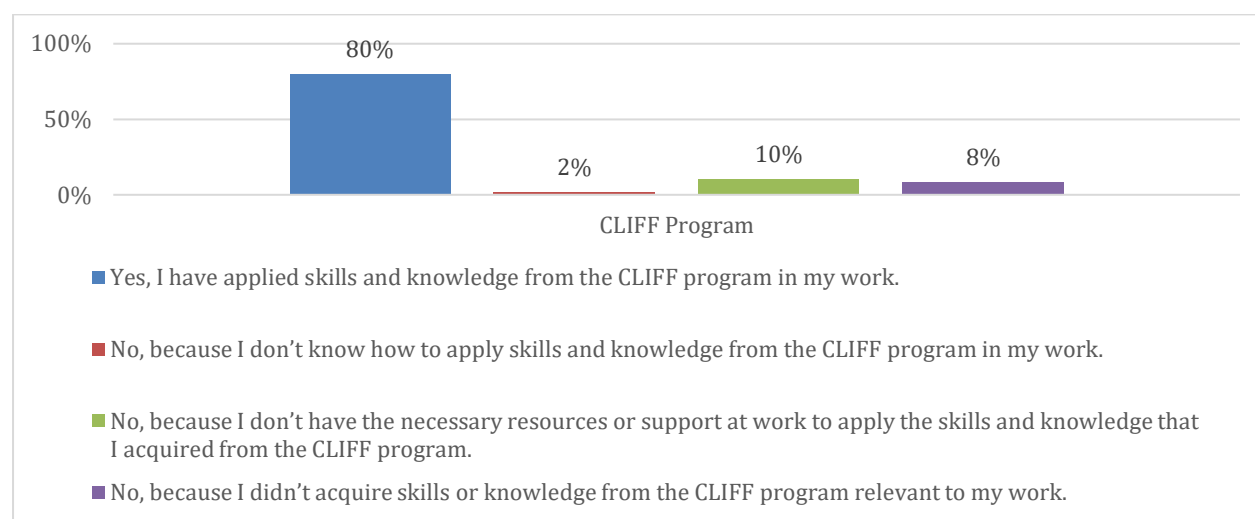
CLIFF-GRADS grantee	Brief outcome description
	<ul style="list-style-type: none"> ▪ Development of a detailed Gender Equality, Female Empowerment and Social Inclusion plan for the Nepal Seed and Fertilizer project USAID funded (2016). ▪ Review of gender related project documents from HEIFER International-led USAID-funded Livestock Innovation Lab Projects (2017) with two other gender experts from the University of Florida and the Government of Nepal. From this came the recommendation of a strategy to integrate gender issues and indicators into current projects that align with the USAID gender guidelines and framework. In this context she conducted a gender analysis on project sites that documents gender gaps in dairy farming system and provided concrete recommendations for addressing these gaps in the life-time of the projects. Additionally, she contributed to the mainstreaming of gender equality/ justice and women empowerment issues in all project components throughout the project cycle. ▪ Advocating for the CCAFS climate change program and bringing gender equality into the Province 4 program level, i.e. Policy and Program Document Action/ Agenda 34 for the Nepal State/ Province (2018). ▪ Contribution to the national climate change program proposal development 'Promoting transformative and climate resilient agriculture for sustainable livelihoods and food security in Nepal' by the Ministry of Agriculture and Development, Nepal, (2018) submitted to Green Climate Fund. She prepared the Gender and Social Inclusion Action plan and Gender Assessment Report on agricultural adaptation in Koshi Basin of Nepal a gender assessment report, climate resilience agriculture in Nepal (led by FAO). ▪ Provision of inputs into the feasibility assessment report (2018) put together by the International Centre for Integrated Mountain Development. ▪ Provision of gender and social development expertise to their program named '<i>Building climate resilience of water shed in mountain ecoregions</i>' for the Ministry of Forest and Environment implemented by Department of Water Sheds (2019)
Carolina Alvarez, CLIFF program 2015	<ul style="list-style-type: none"> ▪ Improved research and measurements for her PhD: She improved her knowledge in techniques for measuring GHG and determination in laboratory and applied this in her position in relationship with a group in CIAT. ▪ Improved communications and networking: She changed the way to communicate her research tailored to the audience, mostly fellow researchers in Latin America. ▪ Informing the new IPCC guidelines for Argentina: The impact of GHG and soil carbon in her research paper from her 2018 work (published in 2019) was included in the new IPCC guidelines for Argentina on 'Sources of Data for Tillage Management Factor' (Chapter 5, line 2655).
Alejandra Marín Gómez, CLIFF program 2017	<ul style="list-style-type: none"> ▪ Part of the Grazing Ecology research group as part of the Federal University of Rio Grande do Sul, Brazil - in a number of matters, e.g. every new semester they are setting up new experiments about grazing management targets, strategies to mitigate enteric methane emissions by ruminants, Integrated crop-livestock farming system for sustainable agricultural production in Brazil. ▪ Attracted further funding for training to support her work, networking and future job opportunities: for some more research by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), participation in an Assessment of emission mitigation options and adaptation strategies - one week course at ZARAGOZA, Spain, with 20 other international course members, sharing experience and knowledge with lecturers from FAO, INRA (2), Bangor University, and the University of Edinburgh who she met them in the course in ZARAGOZA. ▪ Sharing simple practices with smallholders: She learnt how to manage the involvement with the rural community with her research group at CIAT and wrote something for International Day for Rural Women: People feel motivated when they see change rather than being told. In Brazil her advisor, Paulo Carvalho, and the members of the research group started over 10 years ago, 2008, with 20 farmers, now they have ~1000 farmers, who apply the grazing management most of them are smallholders. ▪ Replicated the CLIFF program in form of a partnership btw. Brazil, Federal University of Rio Grande do Sul, and Columbia, AGROSAVIA, for a Master student from Brazil: Provides

CLIFF-GRADS grantee	Brief outcome description
	<p>support with her knowledge, helping her with her hypotheses and research, enabled an exchange opportunity, negotiated costs.</p> <ul style="list-style-type: none"> ▪ Collaboration and provision of advice to Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina in Brazil (= are responsible for a state). She used their laboratory for her first experiment on a similar basis as with AGROSAVIA in Columbia. They now conduct a similar experiment as she did and are still in contact to ask for her advice following a specific protocol.
Joseph Macharia, CLIFF program 2018	<ul style="list-style-type: none"> ▪ Teaching undergraduate courses - approx. with 50 students. He filled the university's general outline with detailed content. At the universities, he observed improved proposal writing for Masters and PhD level and teaching content. ▪ Using the DeNitrification DeComposition Model (DNDC model) which is quite new to Kenya (mostly used in China, Europe, Canada -mostly - and US), despite the model being from 1992. The DNDC model is parameterized and putting factors to enable the comparison of soils measurements from the field and simulations.
Banira Lombardi, CLIFF-GRADS program 2018	<ul style="list-style-type: none"> ▪ Improved research work and measures, like scientific graphing and data analysis as she learnt how use the SigmaPlot Software; calculations that were pending in her doctoral training, because she learned to calculate them correctly, e.g. the calculation of the nitrous oxide emission factor; and determinations of ammoniums and nitrates in the laboratory for her PhD research, which she had never done before; ▪ Wrote a project proposal '<i>Develop of a low cost equipment to measure methane from feedlots pens</i>' submitted to a call from UNICEN, (for USD 2K for 12 months) ▪ Took a course at the Provincial Sustainable Development Agency and built contacts to colleagues who are in charge of the National Inventories submission to the Intergovernmental Panel on Climate Change (IPCC) report. When she will have published her Argentinian PhD research in a journal, she can present to these colleagues to inform their IPCC contribution. The results of her research stay might be important for Colombia, but are not relevant for the Argentinian Inventories.

Outcomes from the survey

80% of the respondents said that they applied skills and knowledge from the CLIFF program in their work. 20% qualified why they were not able to do so. 8% (3) responded that *they have not applied any skills and knowledge from the CLIFF program, because they did not acquire skills or knowledge* from the CLIFF program. See Figure 4 for more details.

Figure 4. Responses to the question: Have you applied skills and knowledge from the CLIFF program in your work?

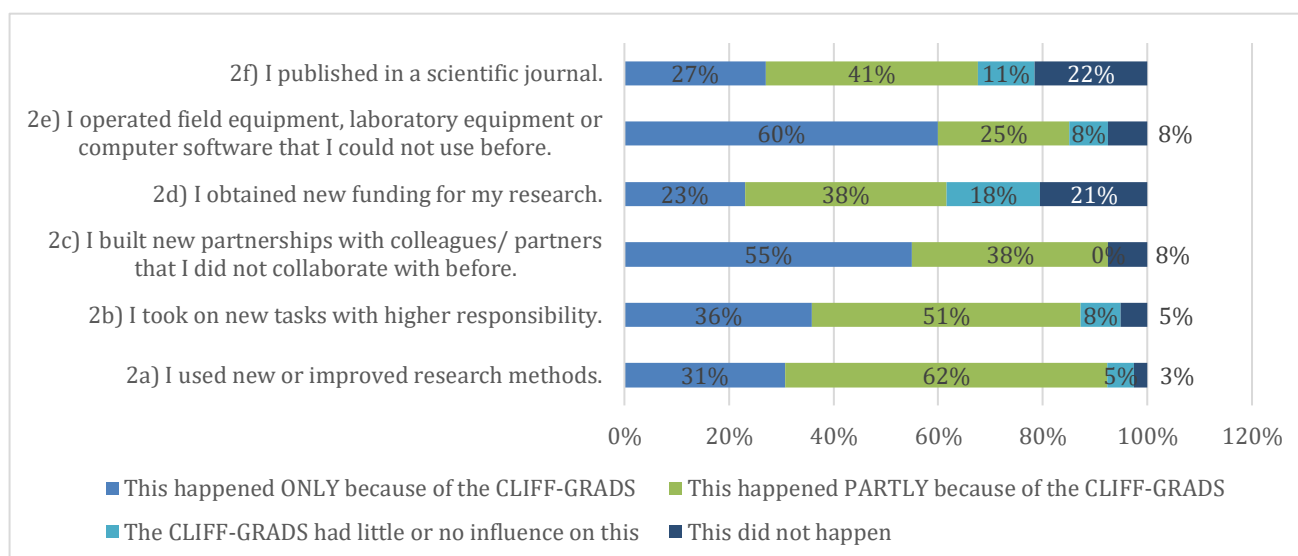


Behavioral changes DURING their graduate research

Below are some selected qualitative indicators that the survey prompted participants on for any behavioral changes **during their PhD and Master's research specifically**. For any additional information please refer to Figure 5.

- 60% operated new field and laboratory equipment or computer software that they could not use before **ONLY** due to the CLIFF program.
- **55% built new partnerships** with colleagues/ partners that they did not collaborate with before, only 8% said that this did not happen.
- **31% used new or improved research methods** **ONLY** due to the CLIFF program, 62% **PARTLY** due to the CLIFF program, and only 8% said that the program had nothing to do with these changes.
- **51% took on new tasks with higher responsibility** **PARTLY** due to the CLIFF program, only 5% and 3% respectively stated that the CLIFF program had nothing to do with this.

Figure 5. Behavioral changes during graduate research



To an open question, if there are any other important changes in their graduate research that they observed due to the knowledge and skills they learned from the CLIFF program, survey respondents added:

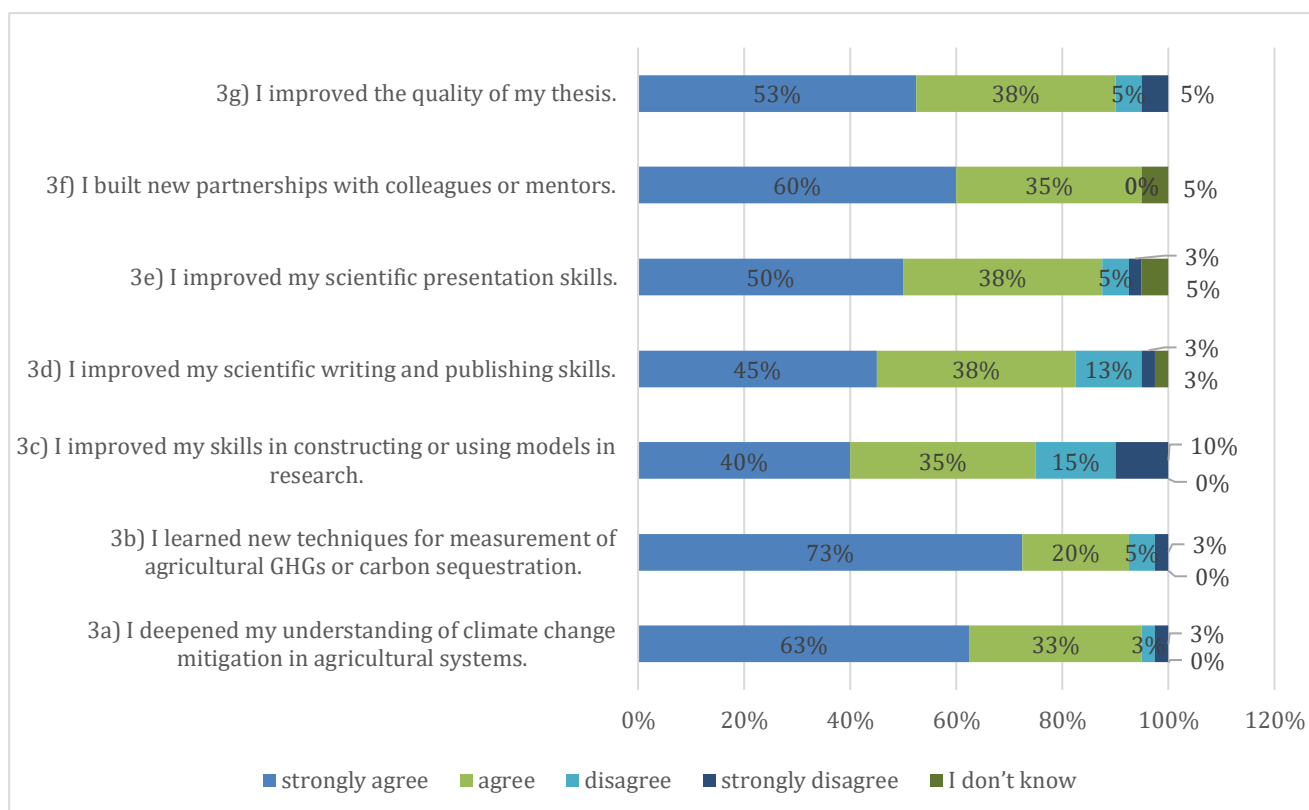
1. *"The CLIFF program linked me to top scientist in the field of greenhouse gases and which has greatly transformed my thinking. The program also facilitated a meeting to Bonn Germany during the COP23 and which was an eye opener."*
2. *"The CLIFF program enhanced the ability to carry out independent research with minimum supervision."*
3. *"I had the opportunity to attend conferences and trainings."*
4. *"Important concepts that allowed to focus in a more logical way some research results, were developed thanks to the contact with scientists in the CLIFF workshop and with the scientists of the visited research centre."*
5. *"I have acquired strong skills on data searching, seeking appropriate repositories and use of adequate vocabulary."*
6. *"Some new tools and techniques learned in GHG measurement."*
7. *"I was already attached to the ILRI laboratory, but the CLIFF fund was helpful for my field work, transportation of samples from Uganda and my stay at the ILRI lab in Nairobi."*
8. *"I was promoted at my work place."*
9. *"I have not yet published in a scientific journal, but the idea is to generate two publications with the data obtained during the stay, so in the future "I published in a scientific journal --> This happened ONLY because of the CLIFF-GRADS. In addition, the idea is to participate in two scientific events this year."*

Behavioral changes DURING the program

Below are some selected qualitative indicators that the survey prompted participants on for any behavioral changes **during the program**. For any additional information please refer to Figure 6.

- 73% confirmed strongly that they learnt new techniques for measurement of agricultural GHGs or carbon sequestration.
- **63%** confirmed strongly that they **deepened their understanding of climate change mitigation in agricultural systems**, only 7% and 4% respectively strongly disagreed or did not know.
- 45% agreed strongly that they improved their scientific writing and publishing skills, 38% agreed.
- **50%** agreed strongly that they **improved their scientific presentation skills**, 38% agreed, while only 5% each disagreed and disagreed strongly.
- **53%** agreed strongly that they **improved the quality of their thesis** due to the CLIFF program and 38% agreed, while only 5% each disagreed and disagreed strongly

Figure 6. Behavioral changes during the program



Additional responses to the open question ‘Did the CLIFF program have any other results for you?’ when thinking of their experience in the CLIFF program after having given their level of agreement or disagreement to the above statements how the CLIFF program affected them (see Figure 6.)

1. *“I learned about **new cultures.**”*
1. *“Definitely yes! First of all, I am so thankful that an organization such as Cliff exists. In addition to information, knowledge and new skills that enhanced my scientific work, Cliff let me **exchange the greatest experience with other researchers in the area of climate change and food security.** Through this opportunity, I was able to develop a very important part of my scientific career and invaluable personal skills. Cliff was essential for the realization of my thesis objectives and the development of innovative and sustainable grazing management strategies what will definitely contribute to the progress of my country.”*
2. *“I became an **expert in laying out fields** to carry out studies on GHG.”*
3. *“It led to an **international exposure.** And an opportunity to interact with renowned climate scientists.”*
4. *“The CLIFF program provided the first opportunity to carry out an interdisciplinary study with experts outside my country. The knowledge obtained has also been shared with students and colleagues.”*
5. *“The CLIFF program allowed me to know the institutions that work on climate change, the programs that are developed around it. It allowed me to interact with young researchers from many parts of the world, as well as to recognize different points of view and research methods.”*
6. *“Sharing of other's research and field experiences.”*
7. *“Being part of the CLIFF represents a **recognition of my work.** It boosts confidence and create opportunities to **increase the network and inspiration towards future research challenges.** I am very proud of being part of it.”*
8. *“I learned to **lead a project,** to make decisions and be **more self confident.**”*
9. *“Being a CLIFF-GRADS awardee gave me **greater visibility,** with potential impact in future links and collaborations with other colleagues beyond those strictly related to my participation in the program.”*

10. *"I was privileged to associate with students and supervisors who were supportive and encouraging allowing me to gain confidence in writing my thesis."*
11. *"It gave me an opportunity to have **international work experience** beyond my border and helped me to figure out my potential."*
12. *"The CLIFF program allowed me to undertake the kind of exchange program where I need to travel to Philippines and do research. It did allow me to understand the agricultural systems there in terms of division of labour, land management, type of farming, irrigation user group management and the gender issues. I got the opportunity to **upscale my horizon level in different scenario for understanding gender and social issue in the research sites**. The CLIFF program experience added value to my work experiences. I have been able to undertake different assignments and tasks related to Climate Change in Nepal."*
13. *"Better collaboration on writing publications."*
14. *"The CLIFF program **only enabled me to travel to another country**. I never sighted nor learned new techniques for measurement of agricultural GHGs or carbon sequestration and I never visited any field nor laboratory, except for a 5 day training I attended which was organized by partner Institutes to my Organization. My **host supervisor and staff were unwilling to share any useful information, software and even the management of the secondary data used**. The discriminatory attitude at the office was very depressing and the inability to obtain a Visa till my departure constrained my mobility and safety."*

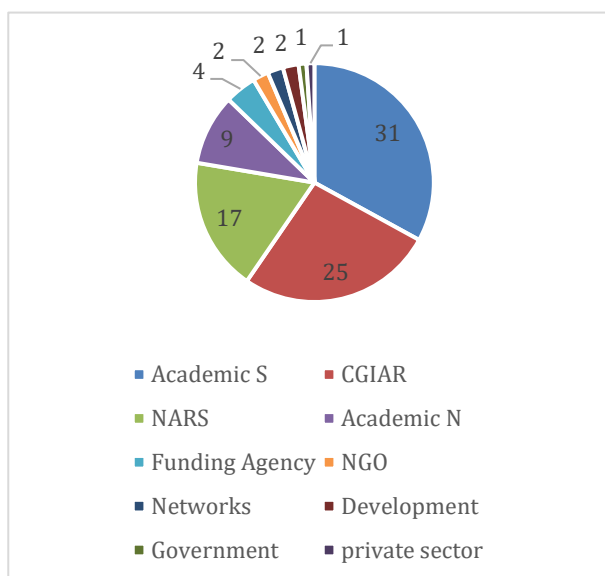
Organizations

During and after the CLIFF-GRADS program, grantees were involved/worked with a wide range of different organizations. In total survey respondents mentioned 94 organizations, which included multi-mention of some organizations.

27% (25 mention) of CGIAR Centers while seven CGIAR Centers were mentioned: CIAT 5, CIFOR 3, CIMMYT 6, ICRAF 2, ILRI 5, IRRI 3, IWMI 1. The split into different categories of organizations is shown in the Figure 7 and the accompanying table.

Table 3 and Figure 7. Types of organizations CLIFF-GRADS grantees worked with

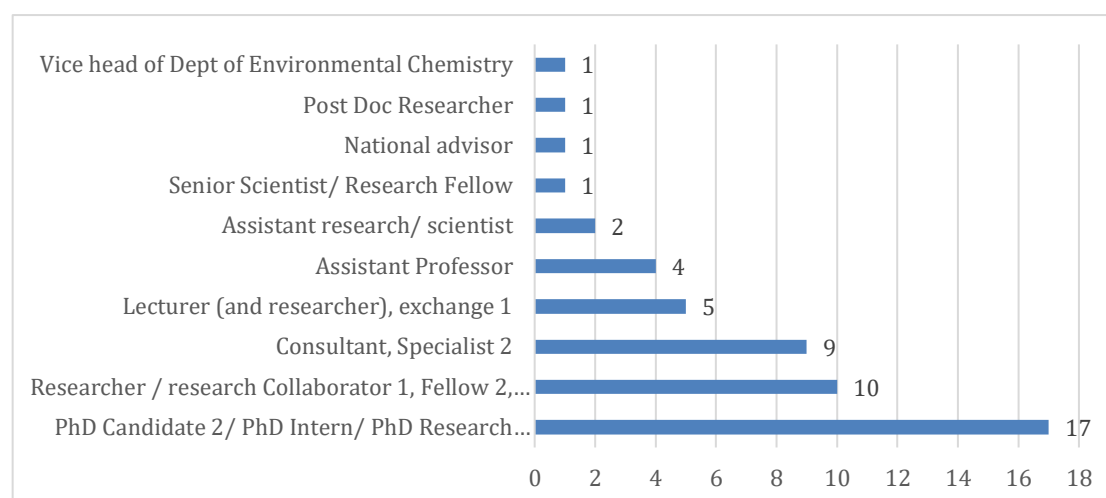
Academic South	31
CGIAR	25
NARS	17
Academic North	9
Funding Agency	4
NGO	2
Networks	2
Development	2
Government	1
Private Sector	1
Total	94



Positions

40% mentioned the **specific position**. Figure 8 gives an overview of what type of positions they mentioned that they had in the abovementioned organizations.

Figure 8. Positions of CLIFF-GRADS grantees in the organizations

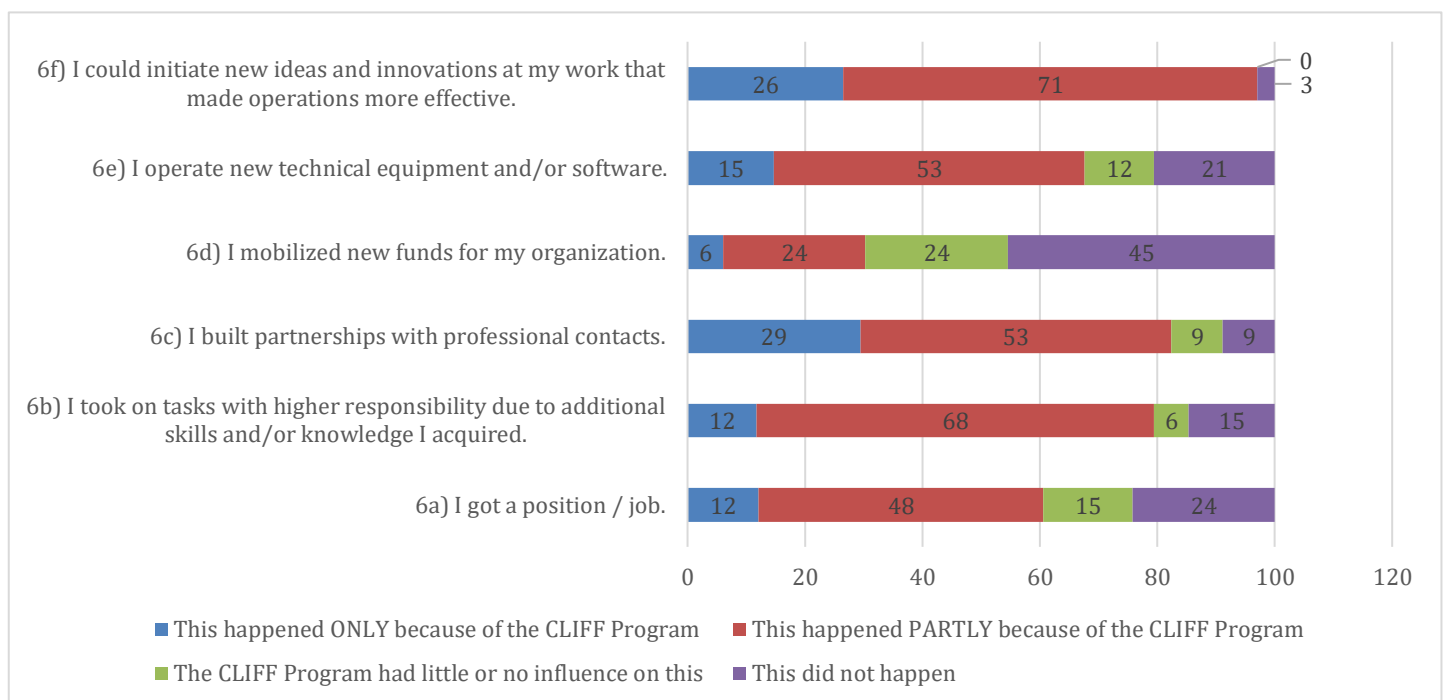


Contributions to their organizations

In their responses they specified what contributions they were able to make to the organizations they were involved with in their respective positions. Figure 9 shows this in more details.

- 71% could initiate new ideas and innovation at their work that made operations more effective PARTLY due to the CLIFF program, 26% ONLY due to the CLIFF program, and only 3% said that this did not happen (at all).
- 40% got a job PARTLY due to the CLIFF program, 10% got a position ONLY due to the CLIFF program, while 20% said that this did not happen.
- 24% mobilized funds for their organization (after program) PARTLY due to the CLIFF program, 6% ONLY due to the CLIFF program and 45% said that this has not happened (yet).

Figure 9. Contributions to the organizations



Additional important contributions to your work due to the knowledge and skills you learnt from the CLIFF-GRADS program:

1. *"I was able to attract more funds and which I have am supervising post graduate students partly because of CLIFF program."*
2. *"Through the CLIFF program I am the first Ph.D student in the department of Agricultural Economics of Ahmadu Bello University, Zaria to develop an optimization model to measure the trade-off between smallholder farmer's welfare and reduction in GHG emissions."*
3. *"I started my PhD with initial funding from CLIFF. After this I got on another project under CIFOR from which I published two other papers thus completing the required 3 papers. It was therefore through CLIFF that I managed to get to CIFOR."*
4. *"I finished my Cliff-grads just 4 months ago, but probably some of these statements will change in the future."*
5. *"I did not learn anything except reviewing of past literature throughout my stay."*

Referees

Overall 38% (15 out of 40) of the respondents provided referees whom we could consults as third parties to back up their claims and examples. It was not possible in the timeframe and resources given to this evaluation to do an independent substantiation of the outcome claims by third parties.

Other comments and testimonials

1. *"For me it was a great opportunity at a professional level. On the one hand, it was my 1st experience writing a research proposal and also the 1st time I presented my work before an international audience."* Cristina Arias-Navarro (CLIFF program 2013)
2. *"The program is doing a good job in transforming lives of the students and positively contributing to international agenda on climate change. Well done CLIFF!"* Joseph Macharia (CLIFF program 2018)
3. *"The CLIFF program enhanced the ability to carry out independent research with minimum supervision. And through the CLIFF program I am the first PhD student in the department of Agricultural Economics of Ahmadu Bello University, Zaria to develop an optimization model to measure trade-offs between smallholder farmer's welfare and reduction in GHG emissions."* Taiwo B. Ayinde (CLIFF program 2014)
4. *"The group of researchers at CIAT on the soil and forage programs is very kind and great to work with."* Carolina Alvarez (CLIFF program 2015)
5. *"CLIFF program allowed me to know the institutions that work on climate change, the programs that are developed around it. It allowed me to interact with young researchers from many parts of the world, as well as to recognize different points of view and research methods. Important concepts that allowed to focus in a more logical way some research results were developed thanks to the contacts with scientists in the CLIFF workshop and with the scientists of the visited research center."* Sandra Guisela Durango Morales (CLIFF program 2017)
6. *"I have acquired strong skills on data searching, seeking appropriate repositories and use of adequate vocabulary."* Jorge Chalco Vera (CLIFF program 2014)

7. *"Being a CLIFF-GRADS awardee gave me greater visibility, with potential impact in future links and collaborations with other colleagues beyond those strictly related to my participation in the program."*
Florencia Garcia (CLIFF-GRADS program 2018)
8. *"I could build a network that improved my capacity to write down research results in a more interesting way. Some of my publications was a result of this network."* Marcia T. de Melo Carvalho (CLIFF program 2011)
9. *"I am using knowledge and skill which I learned from IRRI to our project on measurement GHG emission from paddy field in Central Vietnam."* Hoang Trong Nghia (CLIFF program 2017)
10. *"The CLIFF program has improved over the years. Now you need to be a citizen of a less developed country, which is fairer."* Cristina Arias-Navarro (CLIFF program 2012-2013)
11. *"CLIFF needs to continue and manage to support people who could not have done it otherwise because of funding constraints."* Joseph Macharia (CLIFF program 2018)
12. *"Was super happy about the program and convinced that I benefitted greatly from it. The CLIFF program was a great experience for me individually, my personality, research and knowledge around research. It was a very good experience. I made very good friends and could publish."*
Carolina Alvarez (CLIFF program 2015)
13. *In my opinion, excellent research is conducted by many of the students of the CLIFF program, however, at the time of writing and submitting the results to a scientific journal there are many limitations. I believe that the organizers and leaders of the CLIFF program have the knowledge, experience and tools to give that support to students with greater limitations in that area.* Alejandra Marín Gómez (CLIFF program 2017)

Key success factors of the CLIFF-GRADS program

Summarizing the feedback from the survey responses, below are the success factors that respondents listed:

- Integration of the CLIFF candidates with a mentor in a research institution tied with innovative projects and specific objectives and topics relevant for both students and host institutions.
- Well-matched mentoring by qualified researchers and receiving dedicated guidance on knowledge and skills.
- Opportunities to interact and share ideas with international researchers and other PhDs from different countries and backgrounds.
- Being given access to adequate equipment.
- Provision of economical support, and students in control over the use of the funds.
- The fellowship being an award for PhD candidates starting their career.

How to improve CLIFF-GRADS program relevance and effectiveness

Ideas how to strengthen the program's relevance and effectiveness was of a much wider range than the success factors. Below is a list of most of the improvement suggestions from the survey and the follow-up interviews.

Program design

- Moving beyond funding through CGIAR affiliated organizations but instead allow other research institutions such as universities to have a chance to bid for funds directly to support more students. The alumni can bid competitively for funds and which will promote the growth across various organizations and countries.
- Promote internships among universities and research institutes. To promote exchange of knowledge and infrastructure where necessary.
- Funding for workshops, short courses, specified training, two workshops at initial phase and final phase of research would be very fruitful, and participation in CCAFS Science Conferences, like the 2018 in South Africa and the 2019 Indonesia one, could be integrated.

- Isolating some funds for the alumni to facilitate key conferences attendance since most of the students are not able to acquire this global experience
- Investment in equipment would be something necessary, as some PhDs in developing countries have low or no access to instrumentation to carry out their projects.
- Maybe the country can be factored into the allocated amount of support as there are some differences depending on the region. 10K is not enough as 9K went to the research and equipment.
- Sometimes difficulties in publishing in Open Access (OA) – (which would also be covered by the funds), maybe have some additional funds – they can have some additional budget to support OA, OA is limiting the publishing as some journals charge a lot.
- Include funding MSc/MPhil research not only as an exception.
- More variety and choice to the researchers to select their own research topic.
- Have an enhanced experimental design previously to the training fellowship period.

During the program

- More stress should be put on field experiments.
- Increase the **length of the time** the students spent with their mentors at the host institution.
- The **duration spent with the mentors** are sometimes too short to provide the skills and support needed to complete the study.
- Increase the **amount of funding** to enable cover more research.
- **More interaction** between winning participants.

After the program

- Continuation of the program. Alumni could provide support to the new CLIFF-GRADS candidates.
- Active follow-up to maintain collaborations between the awardees and their hosts.
- **Each student could leave a research proposal based on the experience obtained** in the research centers visited this could contribute to the scientific community.

11. Conclusions from the evaluations

CCAFS support through the CLIFF-GRADS program is an important capacity development contribution to the graduate students. According to the participants, the support through the CLIFF-GRADS program can make a significant contribution to capacity development in their personal and professional life, strengthening of individual knowledge and skills, methods, procedures and routines in their research and work places. In the cases surveyed and interviewed the CLIFF-GRADS program support achieved a variety of capacities and competencies, which are important for the changes that CCAFS aims to encourage and trigger in partner and implementing organizations.

Through the CLIFF-GRADS program supported students had positive catalytic effects and show early or slightly matured contributions to CCAFS program goals. Catalytical effects could be seen in improved research and measuring and in some cases to the extent of concrete contributions to policy level documents, like the IPCC report. In a few cases some mention of additional funds were mentioned that could be attracted. Evidence that administrative structures, infrastructures and equipment was changed in workplaces students were involved with could not be found. Another catalytic effect that grantees mentioned beyond their own careers is their multiplier role they have through their teaching or networking activities.

The support through the CLIFF-GRADS program was generally adequate and appreciated. A few mentioned that they would welcome additional funds for workshops, short courses, specified training can be integrated, the alumni to facilitate key conferences attendance since most of the students are not able to acquire this global experience, and investment in equipment in the context where PhD candidates have low or no access to instrumentation to carry out their projects.

The role of change agents and champions could be made more explicit during the program. Most of the respondents and interviewees revealed great gratitude and appreciation and explicitly mentioned that they want to contribute to ‘paying back’ what they received and experienced through their participation in the CLIFF-GRADS program. There could be benefits in making it more explicit in what different ways the CLIFF-GRADS participants can work as change agents and champions in their future careers. This is an area where alumni could be brought in and share their success stories at networking events and during the workshop some different ways could be illustrated.

A clear vision of the results of the CLIFF-GRADS program can strengthen joint efforts by CCAFS and its partners. The draft nested impact pathways of CCAFS, Flagship 3 and CLIFF-GRADS program give a clear vision of the intended capacity development results. If not yet done these could be also shared in the inception workshop with the CLIFF-GRADS program grantees.

CGIAR Centers the grantees were affiliated to have been commented on as great support. In the cases interviewed and from the survey the mentoring and support provided by the CGIAR Centers was commented upon in a very positive way (with the exception of one where it was considered a mismatch). The facilities and more so the human capacity and competencies in the research teams and mentors was much appreciated in technical and managerial terms. The CLIFF-GRADS program approach of affiliating grantees with a CGIAR Center enhanced international exposure and networking opportunities for the grantees. Though there was a suggestion to open up the affiliation to organizations beyond CGIAR for consideration.

Investment into capacity development is a longer-term return on investment, as such it is hard to quantify in monetary dimensions in the course of a five- or ten-year program. However, it is for a research for development program an important and key mechanism to create any legacy beyond their program life cycles. The candidates become multipliers within their organizations and networks and the inspiration and enthusiasm from the CLIFF-GRADS program participants was absolutely striking in the evaluation.

Annex 1: Survey

Q1: In what year did you complete your CLIFF / CLIFF-GRADS fellowship?

[drop down for years to select 2011-2018]

Q2: Reflect on the **changes that occurred in your PhD or Masters research because of your participation in the CLIFF/ CLIFF-GRADS program**. Consider whether these would have happened without the CLIFF / CLIFF-GRADS program and respond to the questions below. As a result of the skills and knowledge I acquired from my experience in the CLIFF / CLIFF-GRADS program ...

[Rating options:

This happened ONLY because of the CLIFF/ CLIFF-GRADS program.

This happened PARTLY because of the CLIFF/ CLIFF GRADS program.

The CLIFF/ CLIFF-GRADS program had little or no influence on this.

This did not happen.]

I used new or improved research methods.

I took on new tasks with higher responsibility.

I built new partnerships with colleagues/ partners that I did not collaborate with before.

I obtained new funding for my research.

I operated field equipment, laboratory equipment or computer software that I could not use before.

I published in a scientific journal.

Q3: Please think about your **experience in the CLIFF/ CLIFF-GRADS program** and let us know your level of agreement or disagreement with the following statements about how the CLIFF/ CLIFF-GRADS affected you.

[Rating options: Strongly agree | Agree | Disagree | Strongly disagree | I don't know]

I deepened my understanding of climate change mitigation in agricultural systems.

I learned new techniques for measurement of agricultural GHGs or carbon sequestration.

I improved my skills in constructing or using models in research.

I improved my scientific writing and publishing skills.

I improved my scientific presentation skills.

I built new partnerships with colleagues or mentors.

I improved the quality of my thesis.

Q4: Please list organizations where you have worked, studied, consulted, or volunteered since you were a CLIFF/ CLIFF-GRADS Fellow. Please include the name of the organization and your position.

[open text]

Q5: **Referring back to the organizations** that you listed above (question #4), have you **applied the skills and knowledge** that you acquired during the CLIFF/ CLIFF-GRADS program in your work at any of these organizations?

[single selection from the following options

Yes, I have applied skills and knowledge from the CLIFF program in my work.

No, because I don't know how to apply skills and knowledge from the CLIFF program in my work.

No, because I don't have the necessary resources or support at work to apply the skills and knowledge that I acquired from the CLIFF program.

No, because I didn't acquire skills or knowledge from the CLIFF program relevant to my work.

If any other please specify: _____]

Q6: Referring back to the organizations that you listed above (question #4), reflect on the **contributions that you have brought to your work at these organizations because of your participation in CLIFF/ CLIFF-GRADS program**. Consider whether these would have happened without the CLIFF/ CLIFF-GRADS program and respond to the questions below. As a result of the skills and knowledge I acquired from my experience in CLIFF/ CLIFF-GRADS ...

[rating options:

This happened ONLY because of the CLIFF program.

This happened PARTLY because of the CLIFF program.

The CLIFF program had little or no influence on this.

This did not happen.]

I got a position / job.

I took on tasks with higher responsibility due to additional skills and/or knowledge I acquired.

I built partnerships with professional contacts.

I mobilized new funds for my organization.

I operate new technical equipment and/or software.

I could initiate new ideas and innovations at my work that made operations more effective.

Did we forget important contributions to your work due to the knowledge and skills you learnt from the CLIFF/ CLIFF-GRADS program? If so please explain below

Q7: Can you give us any **examples, references**, and/or colleagues that would substantiate the contributions that you kindly provided in response to question #6 above?

[open text]

Q8: In reflecting on your experience with the CLIFF/ CLIFF-GRADS program what were the main **reasons for success** and should not be changed?

[open text]

Q9: In reflection on your experience with the CLIFF/ CLIFF-GRADS program what were the main areas you would **change to improve** its relevance and effectiveness?

[open text]

Q10: If you have **published any articles** from your PhD/Masters studies or research conducted during your CLIFF/ CLIFF-GRADS experience, please list them here using doi links or in bibliographic format (any style). Please include your thesis again, if published.

[open text]

Q11: Are you available for a follow-up interview?

[open text]

Q12: Please provide contact information under at least one of the options below.

[response options: Name | E-mail | WhatsApp (phone incl. country code) | Skype | Other]

Q13: Is there anything else you would like to share with us?

[open text]

Annex 2: List of publications

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- Choudhary, M., Datta, A., Jat, H.S., Yadav, A.K., Gathala, M.K., Sapkota, T.B., Das, A.K., Sharma, P.C., Jat, M.L., Singh, R. and Ladha, J.K., 2018. *Changes in soil biology under*

- conservation agriculture based sustainable intensification of cereal systems in Indo-Gangetic Plains*. Geoderma. 313: 193-204.
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- Marín Gómez, A. (forthcoming) *The tentative title of my first publication is: Optimal pre-grazing sward height of kikuyu for maximizing herbage and nutrient intake of dairy cattle*.

- Marín Gómez, A. (forthcoming) *Another publication could be: Sward height, nutritive values and its implications on the in vitro methane production and ruminal parameters of dairy heifers grazing kikuyu.*
- Macharia, J. 2019. *Soil GHG fluxes for MAIZE production under different soil fertility management practices in East Africa*, forthcoming article, forthcoming end of 2019.
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- Macharia, J. 2019. *Quantification of GHG fluxes and diversion of MAIZE cropping calendar in crop lands under climate variability in Kenya*. PhD Thesis, forthcoming end of 2019 .
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Annex 3: Outcome statements

High-level policy contributions and championing of developing country colleagues – the case of Cristina Arias-Navarro (CLIFF program 2012-2013) is already showing multi-fold impacts of her involvement in the CLIFF program

- 1) High-level policy contributions** to the Intergovernmental Panel on Climate Change (IPCC) report and Subsidiary Body for Scientific and Technological Advice (SBSTA) side events:

She presented International Soil Carbon sequestration research: H2020 CIRCASA in two occasions at the COP24 in Poland (December 2018):

1. Side event at the Pacific and Koronivia Pavillon organized with the Global Research Alliance (GRA) on agricultural greenhouse gases
2. Side event "Forests and Climate Policy under the Paris Agreement" at the EU Pavilion.

And she presented the co-benefits of Soil Organic Carbon (SOC) sequestration at SBSTA50 side event in Bonn in June 2019 (event organized by CCAFS)

Additionally, she is contributing author of the forthcoming [IPCC Special Report on Land and Climate Change](#), Chapter 6. The IPCC will consider the report from 2 - 6 August 2019 in Geneva (50th IPCC Session).

- 1) Support to fellow researchers** and linking them into networks that she built during her CLIFF program participation:
 - a. What she herself is proudest of is that she was able to connect a colleague soil scientist at the Kenya Agricultural and Livestock Research Organization (KALRO) with ILRI and arranged for the colleague to have access to the laboratory and equipment to further her PhD. She also got the colleague invited to a training course and the colleague is now a party members of the group of Kenyan Negotiators (although not due to the training). Connected an

Argentinian fellow CLIFF program grantee (2014) with a Spanish colleague and organizations.

- b. She organizes Summer Schools Exchange between European organization and her connections at ILRI (Klaus Butterbach, Senior Scientist) and INRA (Jean-Francois Susanna, Vice President)

2) Reality check - Another impact from the CLIFF program is that she reminds teams about outer European realities, for example in discussions on different issues in the project, like proposing a Monitoring, Reporting and Verification system for SOC, she always stresses that not all the countries have the same capabilities. Or for instance, when discussing about organizing summer schools, she raises the point that for European students it would be easy to attend, however, students from less developed countries really face challenges (lack of funds mainly) so it is important to think about this and offer support to encourage students from outside Europe to participate. Sometimes it seems that there is no world beyond Europe.

Building confidence and multiplier through teaching – the case of Taiwo B. Ayinde (CLIFF program 2014)

Taiwo was already a lecturer and researcher at Ahmadu Bello University (ABU), Zaria Kaduna State, Nigeria, before her participation in the CLIFF program and is now back there. She teaches Farm Management National Diploma 1 and 2 with an average of about 150 students and the Higher National Diploma 1 with max. 33 about optimization. Currently, she is the only one in the department of Agricultural Economics, (ABU), who looks at how agriculture impacts on the environment. She defended her PhD June 11, 2019. Her experiences in Nigeria vis-a-vie the CGIAR hosting center and expat scientists Professor Mariana C. Rufino, Professor of Agricultural Systems, (Lancaster University, United Kingdom) were contrasting, in that the latter made her believe in herself. Her involvement with mentors of the CLIFF program and subsequently her Borlaug LEAP mentors - Charles F. Nicholson an Adjunct Associate Professor at the Charles H. Dyson School of Applied Economics and Management (Cornell University, Ithaca, USA) and Ayantunde A. Augustine a Senior Animal Scientist at the CGIAR International Livestock Research Institute, Division of Livestock System and Environment in Ouagadougou, Burkina Faso, brought out in her what she already had in her and did not know. For example, in Kenya the group of ten graduate students had to present their work to each other every week, and first thing was to applaud the presenters.

She attended series of seminars, e.g. the 2016 Agricultural and Applied Economic Association (AAEA) Annual meeting in Boston, USA, July 31 - August 2, 2016. She met with fellow researchers in her area of specialization (Environmental Agricultural Economics) and begun discussions on possible collaboration. She is presently working on a paper from her PhD research for publication with the African journal of Agricultural and Resource Economics. Her abstract entitled *“The Economics of Sustainable Tree-Crop-Livestock Intensification And Greenhouse Gas (GHG) Emissions In Smallholder Production System In North-western Nigeria”* was accepted for Poster presentation at the 3rd Agriculture and Climate Change Conference, Budapest, Hungary, March 24 - 26 2019. However, Taiwo was unable to attend the conference due to limitation of funding her institution through the Tet-fund is that the paper/abstract must be considered for oral presentation. Her abstract entitled *“Methods to Trade-offs between Welfare and Greenhouse Gas Emissions in Tree-Crop-Livestock Systems in North-western Nigeria”* submitted to the 5th Global Science Conference on Climate Smart Agriculture in Bali, Indonesia, October 8 - 10, 2019 was not accepted. Taiwo hopes to overcome these challenges with a post-doc or an appointment as a system analyst. She wants to perfect her writing skills for publications and gain more exposure talking at international conferences such as the 4th International Conference on Global Food Security, Montpellier, France, June 16 – 19, 2020.

Multiplier effects to Vietnamese agricultural researchers and practitioners - The case of Vu Duong Quynh (CLIFF program, 2014)

He works at the Institute of Agricultural Environment (VAAS), Vietnam, as the Vice-Head of the Department of Environmental Chemistry and as the Chemistry National Advisory to the International Rice Research Institute (IRRI) office in Vietnam.

Prof. Reiner Wassmann (2014) invited him to work for one project at IRRI with the responsibility of one component, and introduced him to Ole Sander, who led a Climate Clean Air Coalition (CCAC) project. Quynh was the coordinator for the rice component in Vietnam (the component was also implemented in Bangladesh and Columbia). This project is currently waiting for extension and will start in 2019 waiting for response from donor Canada. During the CCAC project he also develop the **AWD suitability map** for Vietnam, which is very useful. It is almost finished, and writing up a paper to be submitted. Additionally, he published 3-4 papers in Vietnamese journals. And he developed the **low carbon rice cultivation guideline under IRRI** for farmers and agricultural staff and researcher, student. Final version is with Ole Sander and his boss.

After finished his PhD his knowledge improved and he had a better understanding of the rice system and relation of the emissions, more confident with the partners and national NGOs. He is trying to change farmers practices to reduce emissions from paddy rice whenever he goes to the field. This means that farmers compost the rice straw a month after harvesting instead of burning or composting it right after harvesting. Since he finished his PhD (May 2014) he went to different provinces. He prepared **different presentations for different audiences**. In his talks he recommends some mitigation options not only the finding from his own research, i.e. not only composting and biogas, but also the Alternate Wetting and Drying (AWD) technology he learnt about during the CLIFF program, easy to apply and much higher emission reductions. While composting and biogas is good but it is a lot of work for the farmers, AWD is much easier for the farmers to apply. The farmers can save up to 30% of water use and reduce methane emissions by 40%. How many farmers have changed to this practice, he cannot say, which could be an opportunity to follow-up with some more evaluative measures.

Explained to colleagues what is the emission and how to measure and analyse the data. Some colleagues and organizations know him and invite him to serves as reviewer for some Vietnamese agricultural journal scientific papers and talk at some workshops, e.g.

- (2016) SNV invited him to present your research results to their staff and local Quang Binh and Binh Dinh Provinces. around 50 people, agricultural staff, farmers and village leaders.

- (2018) the Ministry of Natural Resources and Environment (MONRE) and Ministry of Agriculture and Rural Development (MARD) asked him three times to attend a workshop to develop National D Contribution (NDC) as committed during COP24 to emission reduction submitted to the IPCC.
- (2018) Department of Crop Production under Ministry of Agriculture and Rural Development (MARD) in the Nam Province in August 2018 have a talk about the mechanism of nitrous oxide (N₂O) and methane (CH₄) emissions – 10 people from MARD.

Stronger gender and social equity in Climate Chance – the case of Geeta Bhatrai Bastakoti (CLIFF program 2016)

She does her PhD work as a student affiliated with the Asian Institute of Technology in Thailand and works – while finishing her PhD – as an independent consultant.

After that plans to apply for permanent employment/job.

Under the CLIFF program she was affiliated with IRRI. Was supposed to do a gender study for them. She collected data, but still needs to do the analysis and submit back to them. She utilized some funds to supplement her PhD research. Title of her dissertation is '*Gender implication of climate variability and food security in Nepal*', of which she submitted the draft and expects to complete her PhD in 2019. As part of the PhD work she is expected to publish articles from the dissertation in journals with certain impact factors, one of which is being submitted based on feedbacks of reviewers now in its 2nd revised version. The article is entitled *Gender perceptions of climate variability food security and adaptation practices in Nepal*.

The CLIFF program allowed her to bridge the gender to the climate change and food security topic, do an analysis on a higher level and upscale the analysis focusing on the household level and intra household relationships. The CLIFF program is on the regional local level, and add different angles into the gender components like innovations and adaption practices, and policy interventions.

The CLIFF program was good to get recognition as a researcher and has boosted her understanding of and involvement with international networks. It was a good support for her PhD work itself and later with the work that she carried on after the CLIFF program. Because she was part of the CLIFF program her CV showed international experience and helped with taking on agricultural assignments.

She was asked to provide gender assessment and policy assessment for programs and project of different agency as a gender expert (see examples described below). In most of the programs as a consultant she provided formulated recommendations for

how to move forward with the gender components. However, the recommendations are unfortunately not publicly accessible and only with the respective organizations. Also in most cases the consultant is not aware of whether and which recommendations were considered. Only in one case she was made aware because there was call in the newspaper for bigger men participation and engagement for men for achieving gender equality.

Was the only gender expert with the exception of the ICIMOD feasibility assessment report where there is a gender team at ICIMOD and in the context of the HEIFER International collaboration with University of Florida, where also two additional gender experts provided inputs.

Six concrete examples of her bringing gender to different organization's work are described in the following:

- ➔ (2016) With WWF-FRIPAD Consulting - Hariyo Ban Program (HBP), she provided project **recommendations, e.g. men should be more engaged for the gender equality component**, and they accepted the recommendation and included subsequently more men into project. She knows about this because there was a call in the newspaper for stronger male engagement into the project. Reference: Jagadish Chandra Kuinkel, Livelihood Specialist, email: jagadish.Kuinkel@wwfnepal.org; Rajendra Lamichhane, Monitoring and Evaluation Specialist, email: rajendra.lamichhane@wwfnepal.org.
- ➔ (2016) With USAID - NSAF (Nepal Seed and Fertilizer) Project Activities performed: Develop detailed GESI (Gender Equality, Female Empowerment and Social Inclusion) plan for the Nepal Seed and Fertilizer (NSAF) project according to USAID requirements. Reference: Dr. Ajanhalli Ramiaha Sadananda, Former Seed Coordinator, CIMMYT Nepal, email: doctorbt@gmail.com.
- ➔ (2017) With HEIFER International led USAID funded Livestock Innovation Lab Projects (LSIL), she was involved in a USAID LSIL Project Review. Together with two other gender experts from the University of Florida (UoF, Kathleen Colverson, Sara McKuni) and the Government of Nepal, Heifer International's gender related documents were reviewed. From this came the **recommendation of a strategy to integrate gender issues and indicators into current projects that align with the USAID gender guidelines and framework**. In this context she conducted a gender analysis on project sites that documents gender gaps in dairy farming system and provided concrete recommendations for addressing these gaps in the life-time of the projects. Additionally, she contributed to the mainstreaming of gender equality/ justice and women empowerment issues in all components of the project

throughout the project cycle, from planning through to evaluation. Reference:

Keshav Shah, Program Manager, email: Keshav.Shah@heifer.org.

- ➔ (2018) Consulted on Nepal State/ Province 4 as an independent expert she was part of a research team that got a call from the Province/State 4 asking for recommendations.

Was able to advocate for the CCAFS climate change program and

३४. गाउँपालिकामा “मुख्यमन्त्री वातावरण मैत्री कृषि गाउँ नमूना कार्यक्रम” थालनी गरिने छ। कृषिमा देखिने जोखिम मूल्याङ्कन गरी लैङ्गिक तथा सामाजिक समावेशीकरण विश्लेषण सहित स्थान विशिष्ट वातावरण, कृषि प्रविधि, अभ्यास र सेवाको पहिचान गरिने छ।

bring gender

equality into the Province 4 program level, i.e. Policy and Program Document

Action/ Agenda 34. Climate Friendly Smart Village (see evidence: facebook in Nepali; Translation in English: At Gaupalika Level, 'Chief Minister Climate Friendly Smart Village Program' will be piloted. To address the different challenges in agriculture, the program will apply different technologies and provide extension services considering vulnerability and situational analysis taking into account different gender and social inclusion issues.').

- ➔ (2018) **Contribution to the national climate change program proposal** development '*Promoting transformative and climate resilient agriculture for sustainable livelihoods and food security in Nepal*' – **submitted to Green Climate Fund by the Nepali Ministry of Agriculture and Development** (which will be the implementing agency). Food and Agriculture Organization of the United Nations (FAO) and the Centro Internacional Agricultura Tropica (CIAT) are involved as technical partners in developing the proposal. We are from a research side and the programs lacked specific indicators, e.g. also on gender. Currently, they are in the process of submission. Her contributions was to the preparation of the Gender and Social Inclusion (GESI) Action plan and Gender Assessment Report on agricultural adaptation in Koshi Basin of Nepal a gender assessment report, climate resilience agriculture in Nepal (by FAO). Analyze social aspects of the proposal to inform the project design to ensure the participation of intended beneficiaries, design and a Gender Action Plan. Reference: Shrawan Adhikary, Programme Officer, FAO Nepal. Shrawan.Adhikary@fao.org;

Additionally and linked to this proposal, she **provided inputs into the feasibility assessment report** (that was handed over and done by International Centre for Integrated Mountain Development, ICIMOD) as part of the proposal development as an ICIMOD, Gender Consultant, CRA proposal GESI assessment. Reference: Dr. Suman Bisht, Gender Specialist, ICIMOD, email: suman.bisht@icimod.org, Dr. Pranita

Bhusan Udas, former ICIMOD. While working with FAO on the first part, ICIMOD then reached out to her.

- ➔ (2019) Currently also involved with program named '*Building climate resilience of water shed in mountain ecoregions*' under the Ministry of Forest and Environment implemented by Department of Water Sheds and Soil Conservation (where she is currently affiliated as a gender and social development specialist) in Nepal.
- ➔ (2019) Received an email from one recruiting agency in search of position (this January) from US. The starting sentence in email to me was full of content and happiness for task undertaken by her: '*Hello Geeta: Your name was given to us by one of the world's largest donors in development centered around food security and value chains. We are hoping that you might have a brief moment to discuss a search we're doing in your field of expertise.*'

Informing IPCC guidelines for Argentina on 'Sources of Data for Tillage Management Factor' - The case of Carolina Alvarez (CLIFF program 2015)

She is a Senior Researcher at the Argentinian Instituto Nacional de Tecnología Agropecuaria (INTA) and has a total of five people to help her with her research, two fellowship researchers, and three laboratory technicians. From the CLIFF program, ripple effects occurred from improved research and measurements of her PhD, to increased communication and networking as far as informing of the IPCC guidelines for Argentina.

1. **Improved research and measurements for her PhD:** She improved her knowledge in techniques for measuring GHG and determination in laboratory and applied this in her position in relationship with a group in CIAT. For her current measurements in the field, she does not have the equipment in the laboratory for measuring the gases, but measures around the soil. She has a lot of data for her PhD thesis, entitled '*GHG and emissions from urine and dump in livestock systems*', which she hopes to finish in one year. She was able to add new ideas and innovations at my work place after the CLIFF program, i.e. added one part to her PhD thesis about microbiology in soil, because she learnt it at CIAT. Another line of research in soil management a long-term experiment, one started in 1993 and another started 1995. They are now doing measures in soil carbon, soil nitrogen stock in different crop and tillage systems. These trials have many goals and objectives, to be continued because the changes in soil can be observed still after a long time.

2. **Improved communications and networking:** She changed the way to communicate her research tailored to the audience, mostly fellow researchers in Latin America for example at conferences and little to farmers. She built professional contacts, beyond CIAT, e.g. in Argentina she connected with other researchers, three ex-fellowships in the same institution but different states.
3. **Informing the new IPCC guidelines for Argentina:** The impact of GHG and soil carbon in her research paper from her 2018 work (published in 2019) was included in the new IPCC guidelines for Argentina on 'Sources of Data for Tillage Management Factor' (Chapter 5, line 2655). This could only happen as she improved her practice in scientific and report writing during the CLIFF program.

Taking the CLIFF program into her work field - The case of Alejandra Marín Gómez (CLIFF program 2017)

Doing her PhD in a double program University of Medellin, Columbia, and the Federal University do Grande do Sul Federal do Rio Grande do Sul (UFRGS) in Brazil as a PhD student, while actively participating in a research group in CIAT as a research visitor taking a training to measure methane as part of her PhD work. The part of the CLIFF program was the biggest contribution for her PhD is the topic of her second paper. It is difficult to find laboratories. Additionally, in Columbia she works with an organization AGROSAVIA as a collaborator (she does not get paid), and has a partnership with them on the topic 'how to improve animal production grazing targets to reduce GHG', which is aligned to her research work. She is working with two techniques: the sulfur hexafluoride (SF₆) tracer technique and Gas In vitro technique – linked to the forage program with a focus on sustainable intensification of forage-based systems with low (no additional) inputs.

Part of the Grazing Ecology research group as part of the Federal University in Brazil – is very recognized around the world for more than 20 years with more than 200 papers produced by the group. She is involved in a number of matters, other graze management targets, e.g. every new semester they are setting up new experiments. She is part of the coordination with two Master Student working with her and supports their research related to hers.

Attracted further funding for her work, networking and future job

opportunities: In Feb. 2019 she got another scholarship from the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), as the CLIFF program experience gave her the credibility - Livestock and Climate Change Assessment of emission mitigation options and adaptation strategies – course at ZARAGOZA, Spain for one week with 20 other international course members. Shared her experience and

knowledge with lecturers from FAO, INRA (2), Bangor University, and the University of Edinburgh who she met them in the course in ZARAGOZA. They were motivated to learn more about the grazing strategies, how they involve farmers. Some of them met people from Columbia and know that they are setting up policies to mitigate GHG emissions and working on this. However, she is not sure if they are using any of the insights that she shared. This was the biggest interactions – with good chances for post-doctoral position. This is a good example of the contributions of CLIFF program in her professional and personal life.

Sharing simple practices with smallholders: She could initiate new ideas and innovations at her work that made operations more effective. One of the biggest goals to take knowledge and generate solutions in agricultural systems in Columbia with simple practices and then share her knowledge and work with farmers. She learnt how to manage the involvement with the rural community with her research group at CIAT. She wrote something for International Day for Rural Women - People feel motivated when they see change and especially when they see that it is easy. They identify smallholders, talk to them and ask them if they can use a small plot of land, e.g. a paddock and demonstrate that there is no need for more inputs, but it is just small behavioural changes. When farmers see it is more convincing than just being told. In Brazil started her advisor started 5-8 years ago with 20 farmers, now they have ~1000 farmers, who apply the grazing management most of them are smallholders. In the beginning they were doubters. With their practice they save time, and families can do other activities with their family members. That was the biggest change related with social norms. It was a big incentive and motivation.

Replicated the CLIFF program in form of a partnership btw. Brazil, Federal University, and Columbia, AGROSAVIA, for a Master student from Brazil: Provides support with her knowledge, helping her with her hypotheses and research, enabled an exchange opportunity, negotiated costs, e.g. supervisor and student paid for the tickets and AGROSAVIA paid the living allowance, social security.

Collaboration and provision of advice to Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina in Brazil (= are for a state vs. Embrapa is more federal and general). She used their laboratory for her first experiment on a similar basis as with AGROSAVIA in Columbia. They now conduct a similar experiment as she did and are still in contact to ask for her advice following a specific protocol.

Teaching undergraduates and publishing - the case of Joseph Macharia (CLIFF program 2018)

He is enrolled as a student with Kenyatta University, Kenya. His graduation is scheduled for 26th July 2019. He reached out to the International Livestock Research

Institute (ILRI) with a proposal to showcase his study and apply for support. ILRI colleagues, Lutz Merbold and David Pelster, were interested and forwarded the CLIFF program call to him to apply. To find a study site for laying out the experiments, he reached out to the University of Embu, Kenya, Prof. Daniel Mugendi, agricultural resource management (and vice chancellor of the university). He became part of their research team and got a part time teaching job at University of Embu on ***Climate change and environmental science, climate smart agriculture – teaching undergraduate courses – approx. with 50 students***. He filled the university's general outline with detailed content. He as a lecturer shares his notes with his students and when asked to put together module/s on specific topics. At the university, he observed improved teaching content and proposal writing where has already won a multidisciplinary grant from the National Research Fund (NRF), Kenya which supports for 2 Masters and 1 PhD student.

In Kenya, the DeNitrification DeComposition Model (DNDC model) is quite new (mostly used in China, Europe, Canada -mostly - and US), despite the model being from 1992. The DNDC model is parameterized and putting variables into it which enables the comparison of soils measurements from the field and that of model simulations.

He is working on the following publications – corresponding to the CLIFF program objectives:

- 1) *Quantification of GHG fluxes and derivation of maize cropping calendar in crop lands under climate variability in Kenya*. PhD thesis, 2019
- 2) *Soil GHG fluxes from maize production under different soil fertility management practices in East Africa*, forthcoming article expected in 2019
- 3) *Modelling – GHG fluxes in a semi-arid environment using denitrification decomposition (DNDC model)*, forthcoming article expected in 2020
- 4) Waiting for the papers to be out and work towards a policy brief when he did his seminar defence – as part of KE's government regular submit to UNFCCC. The Kenyan government submits through its Ministry of Environment based on the IPCC Tier I default emission factors that were arrived during the Kyoto Protocol taking certain emission factors into consideration when calculating the measure → the policy is ideally to guide the government – his research measured in the dry area – and if in the future other research sites can be added and eventually arrive at Tier 2, e.g. use the model to estimate for the whole country. Can be linked with the Climate Smart Country Profiles.

Early days - improved research work and measures and likely high-level policy influence to come - the case of Banira Lombardi (CLIFF-GRADS program 2018)

As a doctoral fellow of the National Scientific and Technical Research Council (CONICET) while being affiliated with the National University of Central Buenos Aires (UNICEN) as a PhD student. Through CLIFF GRADS program she improved measurements in her work, for example:

- * She was taught to use the SigmaPlot Software to improve her scientific graphing and data analysis.
- * She improved some calculations that were pending in her doctoral training, because she learned to calculate them correctly, as for example the calculation of the nitrous oxide emission factor.
- * She made determinations of ammoniums and nitrates in the laboratory for her PhD research, which she had never done before.

Additionally, during the stay she was challenged of writing and developing the project, which later in Argentina allowed her to write a project '*Develop of a low cost equipment to measure methane from feedlots effluents*', submitted to a call from UNICEN, (for USD 2K for 12 months) and waiting to see if it get funded (mid-July 2019).

Future outlook: The minister is in charge of the National Inventories submissions to the IPCC – before the stay she took a course at the Provincial Sustainable Development Agency and has the contacts who works on this at the national level, when she publishes her research in a journal, she can present the information to these colleagues who inform the Intergovernmental Panel on Climate Change (IPCC) report.

12. Annex 4: Acknowledgement of CLIFF-GRADS program participants in the evaluation

Soundharajan Bankaru Swamy	Isabel Cristina Molina
Hoang Trong Nghia	Cristina Arias-Navarro*
Alejandra Marín Gómez*	Marcia T. de Melo Carvalho
Joseph Macharia*	Wanyama Ibrahim
Taiwo B. Ayinde*	Vu Duong Quynh*
Zipporah Musyimi	Salome Muriuki
Carolina Alvarez*	Yuechen Tan
R D Jat	Banira Lombardi*
Sandra Guisela Durango Morales	Florencia Garcia
Alice Anyango Onyango	María De Bernardi
Jorge Chalco Vera	Geeta Bhatrai Bastakoti*
Phan Huu Thanh	Tavseef Shah
Bandhu Raj Baral	Ofonime Ime Eyo

Madhu Choudhary
Sheryl Quail

Abubakar Halilu Girei

* indicates that these survey respondents were also selected for follow-up interviews

Note that there were a number of survey respondents that did not state their names.



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